Final Supplemental Environmental Impact Statement

For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines

Forest Service National Forests in Regions 5 and 6
and the Bureau of Land Management Districts
in California, Oregon, and Washington
Within the Range of the Northern Spotted Owl

Lead Agencies:	Forest Service - U.S. Department of Agriculture Bureau of Land Management - U.S. Department of Interior
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Acronyms and Abbreviations

AMA - Adaptive Management Area
BLM - Bureau of Land Management
CEQ - Council on Environmental Quality
CFR - Code of Federal Regulations
dbh - diameter at breast height
DSEIS - Draft Supplemental Environmental Impact Statement
EIS - Environmental Impact Statement
ESA - Endangered Species Act
FEMAT - Forest Ecosystem Management Assessment Team
FLPMA - Federal Land and Policy Management Act
FR - Federal Register
FSEIS - Final Supplemental Environmental Impact Statement
FSM - Forest Service Manual
FTE - full-time equivalent
FY - fiscal year
GIS - Geographic Information System
ISMS - Interagency Species Management System
MMBF - million board feet
MR - Management Recommendation
NEPA - National Environmental Policy Act of 1969
NFMA - National Forest Management Act of 1976
NFP - Northwest Forest Plan
O&C - Oregon and California Railroad Company revested lands
PB - Protection Buffer (re: standard and guideline or species)
PG - Protect from Grazing (re: standard and guideline or species)
PNW - Pacific Northwest Research Station
PSQ - Probable Sale Quantity
PSW - Pacific Southwest Research Station
REO - Regional Ecosystem Office
RIEC - Regional Interagency Executive Committee
ROD - Record of Decision
SP - Survey Protocol
SAT - Scientific Analysis Team
SEIS - Supplemental Environmental Impact Statement
USDA - United States Department of Agriculture
USDI - United States Department of Interior

Abstract

The Forest Service and Bureau of Land Management propose to modify the Survey and Manage and other related species-specific mitigation measures for some rare and/or localized species on National Forest System and Bureau of Land Management lands within the range of the northern spotted owl. These mitigation measures are contained within the standards and guidelines of the Northwest Forest Plan Record of Decision. This Supplemental Environmental Impact Statement (SEIS) presents three action alternatives to better identify protections needed, clarify language, eliminate inconsistent and redundant direction, and establish a process for responding to new information. Alternative 1 redefines Survey and Manage categories based on species characteristics. Alternative 2 is the same as Alternative 1 except that it removes or reassigns the 45 uncommon species within 5 years. Alternative 3 also builds on Alternative 1 by adding equivalent-effort surveys for rare and uncommon species for which pre-disturbance surveys are not practical and prescribing 250-meter buffers for rare species sites.

The preferred alternative is Alternative 1 because, based on the Final SEIS, it provides approximately the same level of species protection intended in the Northwest Forest Plan, better identifies work priorities and needs, eliminates confusing and conflicting language, and reduces impacts to other land management activities to the extent possible without compromising species persistence objectives. Alternative 1 increases predicted probable sale quantity 49 percent and decreases cost 76 percent when compared to the No-Action Alternative. Probable sale quantity for Alternative 1 is 94 percent of the currently declared level of 811 million board feet. None of the alternatives would change the underlying purpose of the Northwest Forest Plan or propose to change other elements of that plan. This SEIS will supplement the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*. The Record of Decision for this SEIS will amend the management direction, as identified herein, in existing Forest Service and Bureau of Land Management plans within western Oregon, western Washington, and northwestern California.

Notice

Readers should note that the Secretary of Agriculture and the Secretary of Interior are the responsible officials for this proposed action. Therefore, no administrative review ("appeal") through the Forest Service will be available on the Record of Decision under 36 CFR 217, and no administrative review ("protest") through the Bureau of Land Management will be available on the Record of Decision under 43 CFR 1610.5-2. Because there is no administrative review of the decision, the Record of Decision will not be signed until 30 days after the Notice of Availability for this Final SEIS appears in the Federal Register (see 40 CFR 1506.10(b)).

The SEIS Interdisciplinary Team analyzed information acquired during the review of the Draft SEIS, and updated information is contained in this Final SEIS. Summaries of all substantive comments, as well as responses to those comments, are included in Appendix I of this Final SEIS.

Summary

Summary

Introduction

This Final Supplemental Environmental Impact Statement (SEIS) assesses three action alternatives for amending management direction which the Agencies use, within the broader framework of achieving the overall goals of the Northwest Forest Plan, to contribute to the conservation of some rare or isolated species. This direction was originally adopted as a set of species-specific or localized mitigation measures to supplement the Northwest Forest Plan's predominantly broad-scale conservation strategy. The action alternatives analyzed in this Final SEIS would amend the Survey and Manage and related mitigation measures. These measures include direction to survey for particular species, manage known species sites, create protection buffers, furnish particular kinds of protection for bats, manage recreation sites to minimize disturbance to species, and protect species sites from grazing. No other changes to Northwest Forest Plan Standards and Guidelines are being considered in this Final SEIS. Nor are there changes being proposed to Northwest Forest Plan land allocations, other than removal of site-specific Late-Successional Reserve and Managed Late-Successional Area designations that are no longer needed to serve as Protection Buffers for certain species.

Background and Context of the Proposed Action

The Northwest Forest Plan, adopted in April 1994 by joint decision of the Secretaries of Agriculture and the Interior, amended Land and Resource Management Plans for the 19 National Forests and 7 Bureau of Land Management (BLM) Districts or portions of Districts within the range of the northern spotted owl. It provides direction for management of habitat for late-successional and old-growth forest-related species in a manner that provides for the species' long-term health, while also providing for a predictable and sustainable level of timber harvest. The core components of the Northwest Forest Plan conservation strategy are (1) a network of late-successional and other reserves distributed across the landscape where management actions must protect or enhance late-successional forest conditions; (2) an aquatic conservation strategy providing for delineation of riparian reserves and other measures to protect or improve aquatic and riparian habitats; and, (3) a series of broadly stated standards and guidelines that guide management actions across the planning area or apply specifically outside reserve areas.

This comprehensive conservation strategy was designed to: formulate a strategy at a broad ecosystem scale, defined as the late-successional and old-growth forests within the range of the northern spotted owl, and provide for the long-term health of the rich diversity of plant and animal communities and species that are an integral part of that ecosystem. Consistent with these goals, the Northwest Forest Plan (1) provided coordinated management direction for both the Forest Service and BLM so that each agency would make an appropriate contribution to species conservation consistent with their respective multiple-use, conservation, and other legal duties and policy objectives and (2) satisfied the National Forest Management Act (NFMA) regulatory standard for maintaining habitat to provide for the viability of vertebrate species on National Forest System lands while also, in recognition of the vital role that non-vertebrate species may play in the healthy functioning of forest ecosystems, meeting a similar standard for all other species to the extent practicable.

During the development of the Northwest Forest Plan, the available knowledge regarding species associated with late-successional and old-growth forests showed that the core components of the conservation strategy would provide for the persistence of the large majority of such species. However, a subset of more than 400 species and species groups was identified for which the core components were potentially inadequate to provide a relatively high likelihood of persistence,

primarily due to apparent rarity and/or significant uncertainty and unavailable information. These species were subjected to more in-depth analysis as documented in Appendix J2 of the 1994 Northwest Forest Plan Final SEIS.

One of the steps in the additional analysis documented in Appendix J2 was to describe and evaluate possible mitigation measures that could help provide a greater assurance of species persistence. A number of these mitigation measures, including Survey and Manage, are species-specific in nature or operate at more of a site-specific level. The species identified as potentially benefitting from Survey and Manage and related local mitigation measures included some birds, mammals, amphibians, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropods. The Secretaries eventually decided to apply five of these types of mitigation measures to just over 400 of the species associated with late-successional and old-growth forests to provide for greater assurance of their persistence. As adopted, the Survey and Manage Standards and Guidelines were divided into four main components: (1) management of known sites; (2) pre-disturbance surveys; (3) extensive surveys to find high-priority sites for species management; and, (4) general regional surveys primarily designed to obtain additional information that could be used to facilitate more effective and efficient conservation planning. The other four species-specific mitigation measures adopted to supplement the core components of the Northwest Forest Plan conservation strategy include designating protection buffers, providing specific kinds of protection for bats, managing recreation sites to minimize disturbance to species, and protecting species sites from grazing. These five mitigation measures, generally referred to collectively as "Survey and Manage" and related standards and guidelines, are the ones subject to analysis and proposed amendment in this Final SEIS.

The Purpose

Implementation Difficulties Include:

1. Some species are more common than anticipated, while other species need more management than originally prescribed.
2. Some species are included in more than one mitigation measure, which creates overlapping direction.
3. Overlapping direction has resulted in funding surveys that may not be necessary or are not efficient.
4. The adaptive management process is not clearly described.

The purpose of the proposed action is to modify Survey and Manage and related mitigation measures: (1) to better identify the management needed; (2) to clarify language; (3) to eliminate inconsistent and redundant direction; and, (4) to establish a process that responds to new information, while continuing to meet the underlying needs of the Northwest Forest Plan. The underlying needs identified in the 1994 Northwest Forest Plan Final SEIS include providing for the viability of late-successional and old-growth associated vertebrate species and providing for a similar standard for non-vertebrates to the extent practicable (as described in the NFP Record of Decision) (USDA, USDI 1994a, pp.1-4, and USDA, USDI 1994b, p. 44).

The Preferred Alternative

The preferred alternative is Alternative 1. It (1) provides approximately the same level of species protection intended in the Northwest Forest Plan; (2) better identifies work priorities and needs; (3) eliminates confusing and conflicting language; and, (4) reduces impacts to other forest management activities. Harvest levels for Alternative 1 are 94 percent of the currently declared PSQ (Probable Sale Quantity).

The Proposed Action

The Agencies are proposing to amend the Survey and Manage and related mitigation measures to improve efficiency and consistency in applying these measures. While retaining the overall strategy for mitigation, the three action alternatives considered in this SEIS would modify how the Agencies provide mitigation for certain species. Since the scope of this action is intentionally

narrow, existing plans would continue largely, though not entirely, unmodified by any of the action alternatives.

To respond to the Purpose and Underlying Need (see Chapter 1), the action alternatives, would:

- Redefine the Survey and Manage categories to better reflect relative rarity of species.
- Clarify objectives and management direction for the Survey and Manage categories.
- Assign species to categories that provide management levels consistent with the needs of the species.
- Define the process for changing management levels for species.
- Define the process for adding or removing species.
- Consolidate Protect From Grazing and some Protection Buffer measures with similar Survey and Manage measures.
- Clarify and amend other species-specific measures and apply them to all Northwest Forest Plan land allocations.
- Clarify which activities require pre-disturbance surveys and where in the planning process they should be conducted.

A decision selecting one of the action alternatives presented in this SEIS would amend the management direction in all existing land and resource management plans in the Northwest Forest Plan area (the range of the northern spotted owl). The amended direction would be effective 30 days after a notice of the Record of Decision for this Final SEIS is published in the Federal Register.

The Issues

The following four issues are identified in Chapter 2 and serve to focus the comparison of the alternatives.

1. *Will alternatives, in concert with other elements of the Northwest Forest Plan, meet species management objectives of the Northwest Forest Plan*?

2. *Will alternatives focus implementation budgets and personnel to those species, habitats, and proposed activities where management is needed to meet species objectives*?

3. *Will the alternatives clarify confusing and conflicting standards and guidelines*?

4. *Will the level of effects on other resource outputs and activities be consistent with those intended when the standards and guidelines were adopted in the Northwest Forest Plan?*

The Alternatives

No-Action: No Change From Current Management Direction
Alternative 1: Redefine Categories Based on Species Characteristics
Alternative 2: Remove or Reassign Uncommon Species Within 5 Years
Alternative 3: Add Equivalent-Effort Survey and 250-Meter Rare Species Site Buffers

The Alternatives

This SEIS assesses the No-Action Alternative and three action alternatives that were designed to accomplish the proposed action. The action alternatives propose to amend existing mitigation measures to improve management efficiency and effectiveness, while continuing to meet the resource objectives envisioned in the Northwest Forest Plan. All three action alternatives retain many of the processes established, to date, for implementing these mitigation measures.

The No-Action Alternative

The No-Action Alternative would continue the current direction in the Northwest Forest Plan Record of Decision (USDA, USDI 1994b) for the Survey and Manage and other mitigation measures described in Chapter 1 of this SEIS. The Survey and Manage Standards and Guidelines involve approximately 400 species or species groups. These standards and guidelines apply four different management categories: (1) manage known sites, (2) surveys prior to ground-disturbing activities, (3) extensive surveys, and (4) general regional surveys. The Northwest Forest Plan Record of Decision identifies (on Table C-3, included in Appendix B of this SEIS) which categories apply to which species or species groups. No clear criteria are provided to indicate why a species belongs in a certain category. No specific provision exists for adding or removing a species or for moving a species from one category to another when there is new information.

The Protection Buffer direction applies to 23 species. Individual sites for 8 species become Late-Successional Reserve; sites for 10 species become Managed Late-Successional Areas; and sites for 5 species add management direction within the Matrix land allocation. Thirteen of the 23 Protection Buffer species are also included in Survey and Manage. This overlap often provides confusing or conflicting direction.

The standard and guideline to Manage Recreation Areas to Minimize Disturbance to Species does not name any specific species and does not apply any specific direction. It was included to remind line officers that the Survey and Manage Standards and Guidelines apply to disturbances in recreation sites.

The standard and guideline to Protect Sites From Grazing applies to 10 mollusk species and 1 vascular plant species. Seven of the mollusk species and the vascular plant species are also included in the Survey and Manage Standards and Guidelines. This standard and guideline requires that species sites be protected from grazing. Grazing is not the only potential source of disturbance to these species.

The standard and guideline to provide Additional Protection for Bats applies direction in the Matrix and Adaptive Management Area land allocations to protect caves, mines, and abandoned wooden bridges and buildings that bats use as roost sites. This standard and guideline includes the need to handle bats for species identification and winter surveys that disturb hibernation. These requirements are controversial because they may be harmful to the bats by causing them to expend energy at times when their energy reserves are low or may cause abandonment of young.

Three Basic Criteria for Survey and Manage

1. The species must occur within the Northwest Forest Plan area, or occur close to the NFP area and have potentially suitable habitat within the NFP area.
2. The species must be closely associated with late-successional or old-growth forest (see Appendix E).
3. The reserve system and other Standards and Guidelines of the Northwest Forest Plan do not appear to provide for a reasonable assurance of species persistence.

The Action Alternatives

Since the Purpose and Need for this action is narrow, the three action alternatives share many elements. The three action alternatives combine Protect from Grazing species and most Protection Buffer species into Survey and Manage. Protection Buffer species not combined into Survey and Manage, and the Additional Protection for Bats, are revised and moved to "Standards and Guidelines Common to All Land Allocations."

All action alternatives redefine Survey and Manage categories based on knowledge and concerns about the species and characteristics affecting practicality of surveys prior to habitat-disturbing activities. The number of categories and the management direction that apply to the species vary by alternative, as shown on Table S-1, and as described in further detail for each alternative. Each category has specific written criteria for

Table S-1. Comparison of Categories for Alternatives 1, 2, and 3 Based on Relative Rarity, Practicality of Pre-Disturbance Surveys, and Status.[1]

Alternative 1 - Redefine Categories Based on Species Characteristics			
Relative Rarity	**Pre-Disturbance Surveys Practical**	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Rare	**Category 1A** - 57 species • Manage All Known Sites • Pre-Disturbance Surveys • Strategic Surveys	**Category 1B** - 222 species • Manage All Known Sites • N/A • Strategic Surveys	**Category 1E** - 22 species • Manage All Known Sites • N/A • Strategic Surveys
Uncommon	**Category 1C** - 10 species • Manage High-Priority Sites • Pre-Disturbance Surveys • Strategic Surveys	**Category 1D** - 14 species[2] • Manage High-Priority Sites • N/A • Strategic Surveys	**Category 1F** - 21 species • N/A • N/A • Strategic Surveys
Alternative 2 - Remove or Reassign Uncommon Species Within 5 Years			
Relative Rarity	**Pre-Disturbance Surveys Practical**	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Rare	**Category 2A** - 57 species • Manage All Known Sites • Pre-Disturbance Surveys • Strategic Surveys	**Category 2B** - 222 species • Manage All Known Sites • N/A • Strategic Surveys	**Category 2C** - 22 species • Manage All Known Sites • N/A • Strategic Surveys
Uncommon	**Category 2D** - 45 species • Manage All Sites Known as of 9/30/99---------->> • No Pre-Disturbance Surveys ---------->> • Strategic Surveys Completed in 5 years --------->		
Alternative 3 - Add Equivalent-Effort Surveys and 250-Meter Rare Site Buffers			
Relative Rarity	**Pre-Disturbance Surveys Practical**	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Rare	**Category 3A** - 301 species • Manage All Known Sites with 250-Meter Buffers ---------->> • Pre-Disturbance Surveys----> Equivalent-Effort Surveys ---------->> • Strategic Surveys ---------->		
Uncommon	**Category 3B** - 24 species[2] • Manage High-Priority Sites ----------> • Pre-Disturbance Surveys---> Equivalent-Effort Surveys > • Strategic Surveys ---------->		**Category 3C** - 21 species • Manage All Known Sites • N/A • Strategic Surveys

[1] Details on management direction are in the text describing each of the three action alternatives. The number of species in each category reflects category assignments in this Final SEIS. The number of species in each category will change over time.

[2] Includes three species with surveys practical, but not necessary, because a sufficient number of sites have been identified to provide a reasonable assurance of persistence. Management Recommendations need to be written to define high-priority sites.

assigning species to that category. Seventy-two species would be removed from Survey and Manage in all or part of their range because: (1) other elements of the Northwest Forest Plan provide a reasonable assurance of persistence; (2) the species are not closely associated with late-successional forests; or, (3) the species are not found in the Northwest Forest Plan area. Three hundred forty-six (346) species would remain on Survey and Manage.

The action alternatives all define and specify the use of Management Recommendations to guide management of known species sites. The alternatives define habitat-disturbing activities and describe the requirements for Survey Protocols that direct surveys prior to habitat-disturbing activities. The action alternatives include a detailed explanation of strategic surveys which apply to all species. Strategic surveys are designed to address specific questions relating to the level of management needed. Finally, each action alternative includes an Adaptive Management section that defines how to change species among the categories and how to add or remove species from Survey and Manage.

Although the action alternatives redefine Survey and Manage categories, all four alternatives (including the No-Action Alternative) provide for various mixes of three elements of management direction: (1) manage known sites, (2) pre-disturbance surveys, and (3) strategic surveys (extensive and regional surveys in the No-Action Alternative). Table S-2 shows the number of species under these three management elements, by alternative, as well as the number of species that would be removed from Survey and Manage. Most species would receive more than one element of management direction.

Alternative 1

Alternative 1 is designed to provide approximately the same level of protection as intended in the Northwest Forest Plan. Survey and Manage, Protect from Grazing, and most Protection Buffer species are grouped into six Survey and Manage categories. These six categories are briefly described below and are based on: (1) the level of relative rarity; (2) the ability to reasonably and consistently locate sites during surveys prior to implementing habitat-disturbing activities; and, (3) the level of information known about the species (see below). For a list of these species by category refer to Table 2-2 at the end of Chapter 2.

For the 346 species in Survey and Manage, Alternative 1 would require surveys prior to habitat-disturbing activities for 67 species where such surveys are considered practical. Manage known sites or manage high-priority sites direction would apply to 325 species and would require buffers

Table S-2. Number of Species in Each Management Direction Element by Alternative.

Management Direction	Alternative			
	No-Action	1	2	3
Manage Known Sites	272	325	301[1]	346
Pre-Disturbance Surveys	87	67	57	322[2]
Strategic Surveys	338[3]	346	346	346
Remove From Survey and Manage	0	63 (and 9 in part of their range)	63 (and 9 in part of their range)	63 (and 9 in part of their range)

[1]Locks known sites at 9/30/99 level for additional 45 species.
[2]Includes "equivalent-effort" surveys, which are similar in conduct. Excludes 3 species with survey not necessary.
[3]Extensive and regional surveys combined in No-Action Alternative.

Alternative 1 - Redefine Categories Based on Species Characteristics			
Relative Rarity	**Pre-Disturbance Surveys Practical**	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Rare	**Category 1A** - 57 species Manage All Known Sites Pre-Disturbance Surveys Strategic Surveys	**Category 1B** - 222 species Manage All Known Sites N/A Strategic Surveys	**Category 1E** - 22 species Manage All Known Sites N/A Strategic Surveys
Uncommon	**Category 1C** - 10 species Manage High-Priority Sites Pre-Disturbance Surveys Strategic Surveys	**Category 1D** - 14 species[1] Manage High-Priority Sites N/A Strategic Surveys	**Category 1F** - 21 species N/A N/A Strategic Surveys

around sites to be large enough to maintain the habitat conditions described in the Management Recommendations for each species. Strategic survey requirements would apply to all 346 species. Seventy-two species would be removed from Survey and Manage in either all or part of their range.

[1] Includes three species with surveys practical but not necessary.

Category 1A - Rare species. Pre-disturbance surveys are practical. The objective of this category is to manage all known sites and minimize inadvertent loss of undiscovered sites. Management direction includes manage all known sites, survey prior to habitat-disturbing activities, and conduct strategic surveys.

Category 1B - Rare species. Pre-disturbance surveys are not practical. The objective of this category is to manage all known sites and minimize inadvertent loss of undiscovered sites. Management direction includes manage all known sites and conduct strategic surveys.

Category 1C - Uncommon species. Pre-disturbance surveys are practical. The objective of this category is to identify and manage high-priority sites. Until high-priority sites can be determined, all known sites are managed. Management direction includes manage high-priority sites, survey prior to habitat-disturbing activities, and conduct strategic surveys.

Category 1D - Uncommon species. Pre-disturbance surveys are not practical or not necessary. The objective of this category is to identify and manage high-priority sites. Until high-priority sites can be determined, all known sites are managed. Management direction includes manage high-priority sites and conduct strategic surveys.

Category 1E - Rare species for which status is undetermined. The objective is to manage all known sites while determining if the species meets the basic criteria for Survey and Manage. Management direction includes manage all known sites and conduct strategic surveys.

Category 1F - Uncommon species for which status is undetermined. The objective is to determine if the species meets the basic criteria for Survey and Manage. Management direction includes conduct strategic surveys.

Alternative 2

Alternative 2 is identical to Alternative 1 for the 301 rare species. Alternative 2 assumes that the 45 uncommon species are the most likely to be removed from Survey and Manage and seeks to expedite that decision by concentrating efforts on completing strategic surveys within 5 years.

Building on the species classifications in Alternative 1, Alternative 2 redefines Survey and Manage into four categories. These four categories are described below. The assignment of species into these four categories is shown on Table 2-2 (located at the end of Chapter 2).

Alternative 2 - Remove or Reassign Uncommon Species Within 5 Years			
Relative Rarity	**Pre-Disturbance Surveys Practical**	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Rare	**Category 2A** - 57 species Manage All Known Sites Pre-Disturbance Surveys Strategic Surveys	**Category 2B** - 222 species Manage All Known Sites N/A Strategic Surveys	**Category 2C** - 22 species Manage All Known Sites N/A Strategic Surveys
Uncommon	**Category 2D** - 45 species Manage All Sites Known as of 9/30/99---------->\ No Pre-Disturbance Surveys ---------->\ Strategic Surveys Completed in 5 years ---------->\		

Like Alternatives 1 and 3, 72 species would be removed from Survey and Manage in all or part of their range. For the 346 species remaining in Survey and Manage, Alternative 2 would require surveys prior to habitat-disturbing activities for 57 species where such surveys are considered practical. Manage known sites direction would apply to 301 species. The remaining 45 species would include manage sites known as of September 30, 1999. Managed sites would be large enough to maintain the habitat conditions described in the Management Recommendations for each species. Strategic survey requirements would apply to all species, but must be completed within 5 years for the 45 uncommon species. In 5 years, the uncommon category is removed from Survey and Manage. After 5 years, the 45 uncommon species would be assigned to the Agencies' special status species programs or dropped from special management consideration.

Category 2A - Rare species. Pre-disturbance surveys are practical. The objective of this category is to manage all known sites and minimize inadvertent loss of undiscovered sites. Management direction includes manage all known sites, survey prior to habitat-disturbing activities, and conduct strategic surveys.

Category 2B - Rare species. Pre-disturbance surveys are not practical. The objective of this category is to manage all known sites and minimize inadvertent loss of undiscovered sites. Management direction includes manage all known sites and conduct strategic surveys.

Category 2C - Rare species for which status is undetermined. The objective is to manage all known sites while determining if the species meets the basic criteria for Survey and Manage. Management direction includes manage all known sites and conduct strategic surveys.

Category 2D - All uncommon species. The objective of this category is to manage all sites known as of September 30, 1999, and complete strategic surveys within 5 years to determine if species-specific management should be dropped or if species should be moved to the Agencies' special status species programs. This category expires in 5 years.

Alternative 3

Alternative 3 builds on the species categories in Alternative 1. The rare species are combined into one category. Known sites for rare species will be protected with a 250-meter buffer. This buffer will ensure the habitat conditions needed by each species are maintained at the site. "Equivalent-effort" pre-disturbance surveys are added for 258 species. Manage known site direction is added for the uncommon, status undetermined category.

Alternative 3 - Adds Equivalent-Effort Surveys and 250-Meter Rare Site Buffers			
Relative Rarity	**Pre-Disturbance Surveys Practical**	**Pre-Disturbance Surveys Not Practical**	**Status Undetermined**
Rare	**Category 3A** - 301 species Manage All Known Sites with 250-Meter Buffers ---------->* Pre-Disturbance Surveys Equivalent-Effort Surveys ---------->* Strategic Surveys ---------->*		
Uncommon	**Category 3B** - 24 species[1] Manage High-Priority Sites ---------->* Pre-Disturbance Surveys Equivalent-Effort Surveys >* Strategic Surveys ---------->*		**Category 3C** - 21 species 1. Manage All Known Sites 2. N/A 3. Strategic Surveys

[1] Includes three species with surveys not necessary.

Alternative 3 redefines Survey and Manage into three categories. These categories are described below. The assignment of species into these three categories is shown on Table 2-2 (located at the end of Chapter 2).

For the 346 species in Survey and Manage, Alternative 3 would require surveys prior to habitat-disturbing activities, either practical surveys or equivalent-effort surveys for 325 species. Manage known site or manage high-priority site direction would apply to all 346 species. Strategic survey requirements would apply to all species. Seventy-two species would be removed from Survey and Manage in all or part of their range.

Category 3A - All rare species. The objective of this category is to manage all known sites and minimize inadvertent loss of undiscovered sites. Management direction includes manage all known sites, survey prior to habitat-disturbing activities, and conduct strategic surveys.

Category 3B - Uncommon species. Pre-disturbance surveys may or may not be practical. The objective of this category is to manage high-priority sites. Until high-priority sites are identified, all known sites will be managed. Management direction includes manage high-priority sites, survey prior to habitat-disturbing activities, and conduct strategic surveys.

Category 3C - Uncommon species for which status is undetermined. The objective is to determine if the species meets the basic criteria for Survey and Manage. Management direction includes manage all known sites and conduct strategic surveys.

Summary of Similarities Between the No-Action and the Action Alternatives

Because the purpose of the proposed action centers around clarifying existing direction rather than re-analyzing the entire Northwest Forest Plan, there are many similarities between the No-Action Alternative and the three action alternatives. Similar to the No-Action Alternative, the action alternatives would continue to:

- Apply the Survey and Manage mitigation measure for rare or isolated species for which the reserves and other elements of the Northwest Forest Plan do not provide a reasonable assurance of persistence.
- Apply the Survey and Manage elements of manage known sites, pre-disturbance surveys, and landscape-scale surveys.

- Specify changing species between categories or removing species from Survey and Manage based on new information and review by the Regional Interagency Executive Committee.
- Apply the objectives and principle management direction for Protection Buffer species.

Summary of Similarities in the Three Action Alternatives

The three action alternatives are alike in several ways. The three action alternatives (Alternatives 1, 2, and 3) all would:

- Redefine Survey and Manage categories based on relative rarity, survey practicality, and level of knowledge about the species. The new categories clarify species objectives and application of management direction.
- Combine standards and guidelines for Survey and Manage and Protect from Grazing, as well as most Protection Buffer species, into a single, more comprehensive, Survey and Manage section.
- Improve management efficiency while continuing to meet the underlying needs of the Northwest Forest Plan.
- Include an adaptive management section explaining how new information is evaluated, how to move species from one category to another, and how to remove species from Survey and Manage.
- Include a process for adding species to Survey and Manage.
- Move the remaining standards and guidelines for Protection Buffers and Additional Protection for Bats to Standards and Guidelines Common to All Land Allocations. The standards and guidelines for these species are amended to provide overall objectives.

Differences in the Three Action Alternatives

The differences in the three action alternatives affect (1) implementation efficiency; (2) the manner and relative level in which individual species are managed; and, (3) the effectiveness of the alternatives in meeting the Purpose and Need. Since the Purpose and Need for this SEIS is relatively narrow, and Alternatives 2 and 3 were developed from the basic structure of Alternative 1, the differences between the action alternatives are relatively few.

Compared to Alternative 1, Alternative 2 would:

- Combine the three uncommon categories into one category. This new category would:
  - Manage sites known as of September 30, 1999. This reduces site management for 24 species and adds management of currently known sites for 21 species.
  - Eliminate the requirement for pre-disturbance surveys for 10 species.
  - Complete strategic surveys for uncommon species within 5 years. These species would either be removed from any special management or be assigned to the Agencies' special status species programs. This affects 45 species.
  - Change the criteria for adding species in the future to the criteria for rare species.

Compared to Alternative 1, Alternative 3 would:

- Combine the three rare species categories into one category and combine two of the uncommon species categories into one category. The three elements of management direction would be applied to all species in both categories.
- Apply a 250-meter buffer to known sites of 301 rare species.
- Require "equivalent-effort" surveys for 25 species where pre-disturbance surveys are

not considered practical. Characteristics of these species reduce the likelihood of finding all sites.
- Apply manage known sites direction to 21 uncommon species with status undetermined.
- Remove due dates for completion of certain Strategic Surveys because the requirement for equivalent-effort surveys reduces their urgency.

Comparison of the Effects of the Alternatives

The following discussion summarizes the environmental consequences disclosed in detail in Chapter 3&4. The environmental consequences of the four alternatives vary as a result of differences in the management of sites and surveys for these species. Anticipated effects outcomes for all species currently under Survey and Manage are summarized below and presented in Table 2-12. Table S-7, located at the end of this section, summarizes anticipated effects for major analyses conducted in Chapter 3&4, including a summary of outcomes by taxa for species that would remain under Survey and Manage in the action alternatives. Table S-8, also located at the end of this section, describes in detail the reasons why some species have outcomes that vary by alternative.

Aquatic Ecosystem

The Northwest Forest Plan was designed to protect streams, lakes, and wetlands within the range of the northern spotted owl. The Aquatic Conservation Strategy is a habitat-based approach developed to restore and maintain ecological health of watersheds and the aquatic ecosystems contained within them on federally managed lands. The four major components of the Aquatic Conservation Strategy (Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration) provide the basis for protecting flora and fauna that are associated with aquatic or riparian habitats. None of the alternatives change any component of the Aquatic Conservation Strategy.

The Survey and Manage elements (manage known sites, manage high-priority sites, etc.) include measures to reduce the risk to species at the site scale. The amount of acreage at these sites is expected to be small and any benefits toward restoring aquatic ecosystems that may be provided by managing known sites are expected to be negligible.

The Survey and Manage Standards and Guidelines also provide a mechanism to collect additional information (such as through strategic surveys or extensive and general regional surveys) to develop and refine species-specific Management Recommendations. This provision allows management of species in isolated habitats that will supplement the protection provided by the Aquatic Conservation Strategy.

Forest Ecosystem

The Northwest Forest Plan utilizes an ecosystem approach to land management to provide habitat for late-successional and old-growth forest associated species. It features a functional, interconnected network of late-successional and old-growth reserves. It also includes provisions for dispersal (short term) and movement (long term) between reserves, that maintain essential processes for selection, adaptation, and evolution. The processes of succession and disturbance are expected to create diverse landscape patterns across the Northwest Forest Plan area.

The species-specific strategy of the Survey and Manage Standards and Guidelines may sometimes conflict with the overall management strategy of the Northwest Forest. Short-term objectives to maintain species persistence in the absence of information about these rare or uncommon species may require a cautious approach to the application of management and restoration activities

otherwise designed to promote long-term ecosystem recovery and function. One example of this potential conflict is the use of prescribed fire to restore ecological functions to fire-associated forests in southern Oregon and northern California. Also, there may be situations where species under Survey and Manage Standards and Guidelines depend on habitat that is a result of excluding fire from the ecosystem.

In the long term, no significant cumulative change is anticipated in the overall functioning of succession or disturbance as a result of implementing the proposed action or any other action alternative. The Northwest Forest Plan Final SEIS concluded that the acres associated with Survey and Manage and related mitigation measures would have a relatively minor effect on the maintenance of a functional and interconnected late-successional forest ecosystem. Although the number of acres associated with Survey and Manage Standards and Guidelines is greater than was anticipated in the Northwest Forest Plan (tens of thousands of acres), their effects are not significant in relation to the approximately 20 million acres (81 percent of the federal lands) managed as reserves. Changes to these Survey and Manage and related mitigation measures are not anticipated to change these conclusions.

Air Quality, Water Quality, and Soil Productivity

The Northwest Forest Plan Standards and Guidelines for air quality, water quality, and soil productivity have begun to improve the general ecosystem health as well as improving management of habitat for late-successional and old-growth forest related species. Air quality is managed by adhering to state requirements (Clean Air Act). Water quality is managed or restored through activities identified in watershed analysis, Water Quality Recovery Plans (Clean Water Act), and/or consultation with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. Soil quality is managed through the Agencies' standards, following Best Management Practices as prescribed by the Clean Water Act, and implementing the Northwest Forest Plan and its Aquatic Conservation Strategy.

In the short term, the requirements for surveys and management of known sites under all alternatives would have the potential to delay or eliminate some management activities that would otherwise benefit air, water, or soil resources. Those actions that could be affected include subsoiling, fuel treatment, upland watershed restoration, and riparian restoration treatments. In the long term, under all alternatives, these conflicts are expected to be reduced or resolved through the use of increased knowledge. The effects of the potential conflicts of Survey and Manage Standards and Guidelines with management activities that would benefit air, water, or soil resources would be minor in the short term and inconsequential in the long term; this effect is based on the relatively small amount of acres (tens of thousands) associated with Survey and Manage, compared to the total 24.5 million acres of federally managed lands within the Northwest Forest Plan area.

Wildland and Prescribed Fire

Fire plays an important role in maintaining the ecosystems of the Eastern Cascades of Washington and Oregon, the California Cascades, and the California and Oregon Klamath Physiographic Provinces. Fire also played a role in establishing the mosaic of conditions in the Douglas-fir forests in the Oregon Coast Range Physiographic Province.

The alternatives vary in the number of acres available, on an annual basis, for prescribed fire and other fuel reduction treatments. Acres available for prescribed fire were projected for each alternative. Costs were also projected based on the amount of area that would require surveys. These projections include reductions for manage known site acres.

S-3. Relative number of acres available for prescribed fire treatment on an annual basis.

	No-Action	Alternative 1	Alternative 2	Alternative 3
Acres of pre-disturbance surveys	154,000	120,000	118,000	161,000
Acres available for prescribed fire*	78,500	103,000	103,400	95,200
Cost ($) of survey per acre	439	64	48	171
Cost ($) per acre treated	862	74	55	289

*Does not include acres of wildland fire use.

Bryophytes

Bryophytes include hornworts, liverworts, and mosses. The No-Action Alternative applied the Survey and Manage Standards and Guidelines to 23 bryophyte species, and the Protection Buffer Standards and Guidelines to 8 bryophytes. There are a total of 27 bryophytes considered under these standards and guidelines; some species are included under both Survey and Manage and Protection Buffer Standards and Guidelines. Under the action alternatives, 11 species of bryophytes are proposed to be removed from these standards and guidelines in all (10 species) or part (1 species) of their range.

For the 11 bryophytes that would be removed from the Survey and Manage Standards and Guidelines across all or portions of their ranges, 5 would have sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to their reference distribution, 1 would have sufficient habitat (including known sites) to allow the species to stabilize in a pattern different from its reference distribution, 4 would have inadequate habitat (including known sites) for species maintenance, and for 1 species there is insufficient information to determine stability and distribution.

Four of the 11 species would be removed from the Survey and Manage Standards and Guidelines under the action alternatives because they do not meet the basic criterion of being closely associated with late-successional or old-growth forest. These four species *(Bartramiopsis lescurii, Herbertus sakuraii, Plagiochila semidecurrens,* and *Radula brunnea)* would be at risk for not maintaining a stable population primarily because all except one known site for these four species are located on nonfederal lands and are not closely associated with late-successional or old-growth forest. However, these four species are being considered for the Agencies' special status species programs.

Compared to the No-Action Alternative, the 17 species (including 1 in a portion of its range) proposed to remain on Survey and Manage would receive different management under the action alternatives as a result of applying new information and the slightly different emphasis of the alternatives.

For four of the bryophyte species that remain on Survey and Manage, there is a moderate level of uncertainty that all alternatives would provide sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to their reference distributions. For 10 of the other bryophyte species, there is insufficient information to determine how any alternative would affect distribution and stability primarily because there are a low number of sites for these species.

The uncertainty varies by alternative for three of the species (*Diplophyllum albicans, Schistostega pennata,* and *Buxbaumia viridis*) that would remain under Survey and Manage. While there is moderate level of uncertainty (due to lack of knowledge and only three recent federal sites), the No-Action Alternative and Alternatives 1 and 3 would provide sufficient habitat (including known sites) for *Diplophyllum albicans* to stabilize in a pattern similar to its reference distribution. This same conclusion applies to Alternative 2, however, with a high degree of uncertainty because only

sites known as of September 30, 1999, would be managed. For *Buxbaumia viridis,* the No-Action Alternative and Alternatives 1 and 3 would provide sufficient habitat (including known sites) to allow *Buxbaumia viridis* to stabilize in a pattern similar to its reference distribution. This same conclusion applies to Alternative 2, however, with a moderate level of uncertainty because only sites known as of September 30, 1999, would be managed. For *Schistostega pennata*, all alternatives would provide sufficient habitat (including known sites) for the species to stabilize in a pattern similar to its reference distribution with a high level of uncertainty in the No-Action Alternative and with a moderate level of uncertainty in the action alternatives. Anticipated effects outcomes for these species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Fungi

There are 225 fungi included in the Survey and Manage Standards and Guidelines in the No-Action Alternative.

The status of most fungi is either unchanged or changed to provide slightly increased protection under Alternatives 1, 2, and 3 compared to the No-Action Alternative. There are 196 species under Alternative 1, 202 species under Alternative 2, and 209 species under Alternative 3 that would be either unchanged or receive greater protection. Many species of fungi are so rare that some risk to persistence will occur regardless of which alternative is selected. Thirteen species have not been seen in more than 30 years and are probably extirpated within the Northwest Forest Plan area. Ninety-six species of fungi are known from five or fewer sites within the last 30 years and another 61 are known from between 6 and 20 sites within the last 30 years. Populations with low numbers of individuals are inherently unstable and species with few populations and limited distribution have risk to their persistence. There continues to be uncertainty regarding the expected future condition of many of these fungi due to their rarity within the Northwest Forest Plan area. Implementation of strategic surveys under all action alternatives (or extensive or general regional surveys under the No-Action Alternative) would help reduce this uncertainty.

Species for which protection is decreased in the action alternatives compared to the No-Action Alternative include Protection Buffer species that would no longer receive pre-disturbance surveys and species that are removed from the Survey and Manage Standards and Guidelines. Pre-disturbance surveys would no longer be required for seven species under Alternatives 1 and 2, and for two species under Alternative 3.

Under the action alternatives, 16 species would be removed from Survey and Manage Standards and Guidelines because they do not meet the basic criteria for Survey and Manage or they are synonyms of other species. Two other species are removed from the Survey and Manage Standards and Guidelines in part of their range because they do not meet the basic criteria for Survey and Manage in those areas and all alternatives would provide sufficient habitat (including known sites) to allow these species to stabilize in a pattern similar to their reference distributions.

All alternatives would provide sufficient habitat (including known sites) to allow 29 species of fungi to stabilize in a pattern similar to their reference distributions, 28 with a moderate level of uncertainty and 1 with a high level of uncertainty. While there is a moderate level of uncertainty, all alternatives would provide habitat (including known sites) sufficient to allow five species of fungi to stabilize in a pattern different from their reference distributions.

One hundred and sixty-four (164) species are so rare that there is inadequate habitat (including known sites) to maintain the species under any alternative; 13 with a low level of uncertainty, 139 with a moderate level of uncertainty, and 12 with a high level of uncertainty. Concerns for stability of these species is a function of their rarity and possibly loss of historic habitat and not related to the design or possible implementation of the alternatives. Finally, for 11 species, there is insufficient information to determine how any alternative would affect distribution and stability. However, known sites are managed for these species, strategic surveys will be conducted, and, if

pre-disturbance surveys are practical, they will be conducted prior to habitat-disturbing activities. Anticipated effects outcomes for these species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Lichens

Lichens are a conspicuous component of old-growth forest ecosystems where they play an important ecological role. The habitat components important to lichens include live, old-growth trees, decaying wood, riparian zones, and extensive and interconnected late-successional and old-growth forest conditions. Under the No-Action Alternative, the Survey and Manage Standards and Guidelines were applied to 81 lichen species.

Thirty-five species would be removed from Survey and Manage and Protection Buffer Standards and Guidelines under the action alternatives, either in all (32 species) or portions (3 species) of their range, because they no longer meet the three basic criteria for inclusion under the Survey and Manage Standards and Guidelines. For the 35 lichens that are removed from the Survey and Manage Standards and Guidelines, 25 species, including the 3 split range species, are expected to maintain stable populations and be distributed in a pattern similar to their reference distributions on federally managed lands within the Northwest Forest Plan area, with varying levels of uncertainty. While there is a high level of uncertainty for three species, all alternatives would provide inadequate habitat (including known sites) to maintain the species. There is insufficient information regarding seven species to determine how any alternative would affect distribution and stability. Fourteen species of lichen (including the three with inadequate habitat and the seven with insufficient information) are being removed from Survey and Manage because they do not meet the criterion of being closely associated with late-successional or old-growth forest and are being considered for management under the Agencies' special status species programs.

Compared to the No-Action Alternative, 49 species, including the 3 split range species, receive different management under the action alternatives as a result of the application of new information and the slightly different emphasis of the alternatives. Under Alternative 1, pre-disturbance surveys are added for 9 lichens, management of known sites is increased for 23 lichens, and known site management is removed for 1 lichen. There is no change for the number of species receiving strategic surveys under Alternative 1 as compared to the No-Action Alternative. Under Alternative 2, 30 lichens receive increased known site management; eight of these 30 species receive site management only for sites known of September 30, 1999. Also under Alternative 2, pre-disturbance surveys are added for 8 lichens and known site management is removed for 2 lichens. Under Alternative 3, 29 lichens receive increased known site management and pre-disturbance surveys are added for 39 lichens.

Most of the lichens have an equal or greater likelihood of meeting persistence objectives under the action alternatives when compared to the No-Action Alternative.

Of the 49 lichens remaining under Survey and Manage, four species were split for analytical purposes due to differences in anticipated effects in different parts of their ranges. This resulted in 53 separate determinations for these 49 species. All alternatives would provide sufficient habitat (including known sites) to allow 15 species to stabilize in a pattern similar to their reference distributions, with various levels of uncertainty. All alternatives would provide habitat (including known sites) sufficient to allow six species to stabilize in a pattern different from their reference distributions, with various levels of uncertainty.

All alternatives would provide inadequate habitat (including known sites) to maintain 12 species, with moderate to high levels of uncertainty. This is primarily due to lack of knowledge regarding these species and their rarity and/or limited habitat or known sites on federally managed land and is not related to the design or possible implementation of the alternatives. There is insufficient information regarding 20 species to determine how any alternative would affect distribution and stability. However, known sites are managed for these species, strategic surveys will be

conducted, and, if pre-disturbance surveys are practical, they will be conducted prior to habitat-disturbing activities. Anticipated effects outcomes for these species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Vascular Plants

Vascular plants are those that contain conducting or vascular tissue. They include seed-bearing plants (flowering plants and trees) and spore-bearing plants (ferns, horsetails, and clubmosses). The Survey and Manage Standards and Guidelines apply to 16 vascular plant species under the No-Action Alternative. Six species of vascular plants (four throughout their ranges and two in part of their ranges) would be removed from Survey and Manage in the action alternatives while 12 vascular plants (10 throughout their ranges and 2 in part of their ranges) would remain under Survey and Manage.

Under the action alternatives, four species of vascular plants (*Allotropa virgata, Clintonia andrewsiana, Pedicularis howellii,* and *Scoliopus bigelovii*) would be removed from the Survey and Manage Standards and Guidelines throughout their range and two other species (*Botrychium minganense* in Washington and *Galium kamtschaticum* in the WA Western Cascades, north of Snoqualmie Pass) would be removed from the Survey and Manage Standards and Guidelines in part of their range. These species no longer meet the basic criteria for Survey and Manage Standards and Guidelines in all or part of their range (see Table 2-2 and Table F-2). All six of the vascular plants that would be removed from Survey and Manage in all or a part of their range, are expected to have sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to their reference distributions.

Compared to the No-Action Alternative, 12 species would receive different management under the action alternatives as a result of applying new information and the slightly different emphasis of the alternatives. Under Alternatives 1, 2, and 3, strategic surveys would be added for 12 vascular plants. Under Alternatives 2 and 3, one vascular plant would receive increased known site protection. Under Alternative 2, pre-disturbance surveys would be removed for four vascular plants.

Nine of the 12 vascular plant species that remain under the Survey and Manage Standards and Guidelines in all or a part of their range are expected to have sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to their reference distribution under all alternatives. The likelihood of stable populations for these species is greater under Alternatives 1 and 3 as compared to the No-Action Alternative and Alternative 2. All alternatives are expected to provide *Eucephalus vialis* habitat sufficient (including known sites) to allow the species to stabilize in a pattern different from its reference distribution. The action alternatives would provide *Cypripedium fasciculatum* and *Cypripedium montanum* sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to reference distribution while the No-Action Alternative would provide habitat sufficient (including known sites) for them to stabilize in a pattern different from their reference distribution. Anticipated effects outcomes for these species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Arthropods

Arthropods are invertebrates with jointed legs, a segmented body, and an exoskeleton (an external supporting covering). They include insects, crustaceans, arachnids, and myriapods. Collectively, arthropods constitute over 85 percent of the biological diversity in late-successional and old-growth forests in the Pacific Northwest.

Arthropods are treated as functional groups (i.e. guilds) with many taxa represented in each group, instead of as individual species. It was a conclusion of the Northwest Forest Plan Final SEIS that there was a concern for persistence for four arthropods guilds (litter and soil dwelling species, coarse wood chewers, understory and forest gap herbivores, and canopy herbivores) located in the

Oregon and California Klamath, California Cascade, and California Coast Range Physiographic Provinces, primarily because of concerns associated with natural and prescribed fire and thinnings. There is no new information gathered since approval of the Northwest Forest Plan that alters the basic assumptions or conclusions that expressed a concern that the ecological functions of these four arthropods guilds may not persist in the south range. Survey efforts are currently underway to acquire additional information on community composition, abundance, and distribution, and to determine necessary levels of protection for the arthropod guilds. Anticipated effects outcomes for these guilds are displayed in Table 2-12 and summarized by taxa in Table S-7.

Mollusks

Mollusks are invertebrate animals (such as slugs and snails) that have a soft unsegmented body usually enclosed in a calcareous shell. Mollusk species that inhabit Northwest forests include land snails, slugs, aquatic snails, and clams. As a group, mollusks are diverse in number and function. Many mollusks have restricted geographic ranges and narrow ecological requirements.

Two mollusks, *Prophysaon coeruleum* and *P. dubium*, would be removed from the Survey and Manage Standards and Guidelines under all action alternatives; one, *P coeruleum*, would be removed only in part of its range. The action alternatives would provide sufficient habitat to allow *P. dubium* to stabilize in a pattern different from its reference distribution while the No-Action Alternative would provide sufficient habitat to allow *P. dubium* to stabilize in a pattern similar to its reference distribution. The action alternatives would remove *P. coeruleum* in Oregon from Survey and Manage. There is uncertainty related to the taxonomic status of *P. coeruleum*; it may be one or more species. If *P. coeruleum* is a single species, all alternatives would provide sufficient habitat for the species to stabilize in a pattern different from its reference distribution. However, if *P. coeruleum* is more than one species, there is insufficient information regarding this species to determine how any action alternative would affect distribution and stability while the No-Action Alternative would provide sufficient habitat to allow the species to stabilize in a pattern different from its reference distribution.

There are 46 species of mollusks that would remain under the Survey and Manage Standards and Guidelines under the action alternatives.

Compared to the No-Action Alternative, species receive different management under the action alternatives as a result of the application of new information and the slightly different emphasis of the alternatives. Under Alternatives 1, 2, and 3, strategic surveys are added for 46 mollusk species. Alternative 1 would remove pre-disturbance surveys for nine mollusk species and would remove two mollusk species from known site management. Alternative 2 would remove pre-disturbance surveys from 11 mollusk species and known site management from 4 species. Alternative 3 would add pre-disturbance surveys for three mollusk species.

Under all alternatives, 36 mollusks would be expected to have an outcome of stable populations. For the remaining 10 mollusk species, there would be some risk to stable populations. This risk varies by alternative. Alternative 3 would provide the best opportunity for stable populations because no mollusks are considered at risk to stability primarily because of the requirement for equivalent-effort, pre-disturbance surveys.

Alternative 1 would not provide a reasonable level of assurance for stability of 10 species. Eight rare species are at risk to stability because of the lack of pre-disturbance surveys. Two species are considered at risk to stability because management of known sites and pre-disturbance surveys would not be conducted for these uncommon species. Alternative 2 would not provide a reasonable level of assurance for stability for eight species because of the lack of pre-disturbance surveys. The No-Action Alternative would not provide for a reasonable level of assurance of stability for three Protect from Grazing species because of the lack of pre-disturbance surveys and strategic surveys. Anticipated effects outcomes for these species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Amphibians

Amphibians are cold-blooded vertebrates, including salamanders, that have four limbs and glandular skin and are tied to moist or aquatic habitats for all, or at least part, of their life cycle. Five salamanders (Del Norte, Larch Mountain, Shasta, Siskiyou Mountains, and Van Dyke's) are included in the Survey and Manage Standards and Guidelines under all alternatives. No salamanders are proposed to be removed from the Survey and Manage Standards and Guidelines under any alternative.

Compared to the No-Action Alternative, species would receive different management under the action alternatives as a result of applying new information and because of the slightly different emphasis of the alternatives. Under Alternatives 1, 2, and 3, strategic surveys would be added for all five salamander species. Alternatives 1 and 3 would remove pre-disturbance surveys for the Del Norte salamander. Alternative 2 would remove pre-disturbance surveys for the Del Norte and Siskiyou Mountains salamanders.

The No-Action Alternative generally provides less protection than the action alternatives for Shasta, Van Dyke's, Larch Mountain, and Siskiyou Mountains salamanders (except for Alternative 2) and roughly equal protection to Del Norte salamanders (except for Alternative 2). For Van Dyke's, Larch Mountain, and Siskiyou Mountains salamanders, the No-Action Alternative provides sufficient habitat (including known sites) to allow the species to stabilize in a pattern similar to their reference distributions. For Shasta and Del Norte salamanders, the No-Action Alternative would provide habitat (including known sites) sufficient to allow species to stabilize in a pattern different from their reference distributions.

Under Alternatives 1 and 3, all five salamanders are projected to have sufficient habitat (including known sites) to stabilize in a pattern similar to their reference distributions with varying levels of uncertainty.

Under Alternative 2, the Shasta, Larch Mountain, and Van Dyke's salamanders are expected to have sufficient habitat (including known sites) to stabilize in a pattern similar to their reference distribution. For both the Siskiyou Mountains and Del Norte salamanders, while there is a high level of uncertainty due to the inability to project future management, this alternative would provide habitat (including known sites) sufficient to allow species to stabilize in a pattern different from their reference distributions. Anticipated effects outcomes for these species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Late-Successional Birds

The Northwest Forest Plan Final SEIS addressed the habitat needs of 36 bird species which were identified as closely associated with late-successional and old-growth forests. None of the alternatives in this SEIS would affect the original basis for effects or conclusions relating to 31 of these 36 species. It is expected that these 31 species of late-successional birds would have stable, well-distributed populations. This same conclusion applies to the remaining five species, but they are discussed in greater detail below.

Black-backed Woodpecker, White-headed Woodpecker, Pygmy Nuthatch, and Flammulated Owl

The action alternatives would move these four species from the Protection Buffer Standards and Guidelines, which applied only in the Matrix land allocation, to standards and guidelines common to all land allocations. This would broaden the area where specific management attention would be given to these species. The effect in reserve land allocations would be minimal, since management of these land allocations would presumably maintain high levels of snags over time, at or near 100 percent population potential for most snag dependent species. The action

alternatives also include three changes to the management requirements for these species. The effect on Matrix and Adaptive Management Area land allocations would be similar to existing management direction because this standard and guideline already applies to those lands.

The action alternatives are expected to provide better habitat conditions for these species than the No-Action Alternative, due to their ability to incorporate updated information into Management Recommendations and provide for more effective retention of critical habitat components, including snags. An additional benefit to these species would be the ability to anticipate snag needs for these species when modeling and designing restoration activities (such as thinning to accelerate tree growth) in reserve allocations. All alternatives would provide sufficient habitat to allow these species to stabilize in a pattern similar to their reference distributions within the planning area.

Great Gray Owl

The action alternatives propose to move this species from the Protection Buffer to the Survey and Manage Standards and Guidelines. This change is expected to have no difference in how the habitat for this species is identified or delineated.

In the No-Action Alternative, occupied sites would become a Late-Successional Reserve with associated standards and guidelines. In the action alternatives, the great gray owl would be a Survey and Manage species, and would continue to receive similar management when compared to the No-Action Alternative. The No-Action Alternative requires a Late-Successional Reserve Assessment, subject to review by the Regional Ecosystem Office, for each site. Under Alternatives 1, 2, and 3 sites would be managed under a Management Recommendation subject to review by the Regional Ecosystem Office. The action alternatives provide more flexible management direction that facilitates incorporating new data and information, and potentially more effective management of known sites, than would the No-Action Alternative.

All alternatives, with varying levels of certainty, would provide sufficient habitat (including known sites) to allow the great gray owl to stabilize in a pattern similar to its reference distribution. The anticipated effects outcome for this species is displayed in Table 2-12 and summarized by taxa in Table S-7.

Late-Successional Mammals

The Northwest Forest Plan Final SEIS addressed the habitat needs of 14 mammal species which were identified as closely associated with late-successional and old-growth forests. None of the alternatives in this SEIS would affect the original basis for effects or conclusions relating to 11 of these 14 species. It is expected that these 11 species of late-successional mammals would have stable, well-distributed populations. Bat species and red tree voles are discussed below. Canada lynx has been listed as threatened under the Endangered Species Act and is addressed in the Threatened and Endangered Species discussion.

Bats

The three action alternatives incorporate identical management direction for bats and would have identical effects. Under the action alternatives, management direction that requires species-specific identification of bats would be removed until survey methods that eliminate the potential adverse effects on bats are developed. This change from the No-Action Alternative potentially eliminates or greatly reduces adverse effects from surveys. Under the action alternatives, structures including caves, mines, abandoned wooden bridges, and old buildings would be managed to protect the sites if any bat species were located. All alternatives would provide sufficient habitat to allow bats to stabilize in a pattern similar to their reference distribution.

Red Tree Vole

The Oregon red tree vole is endemic to western Oregon and extreme northwestern California. Its distribution is limited to the moist coniferous forest west of the crest of the Cascade Mountains. The red tree vole depends on conifer tree (primarily Douglas-fir) canopies for nesting sites, foraging, dispersal routes, escape cover, and moisture. Red tree voles appear to be closely associated with late-successional forest habitat and may be sensitive to habitat disturbance. Red tree voles are an important prey species for the northern spotted owl. Specific habitat conditions are assessed in five subzones to account for land ownership patterns and specific habitat conditions within the species' range.

Four subzones are composed of the species typical habitat. Under the No-Action Alternative and Alternatives 1 and 3, the red tree vole is expected to have sufficient habitat (including known sites) to maintain stable populations distributed in a pattern similar to its reference distribution on federally managed lands within these zones, but with a high degree of uncertainty. While there is a moderate level of uncertainty due to lack of knowledge regarding dispersal, current population trends, and gene flow between populations, Alternative 2 would provide inadequate habitat to maintain stable populations of the species in these subzones. This outcome under Alternative 2 is due in part to land ownership patterns, but is also due to the lack of pre-disturbance surveys, the requirement to manage only those sites known as of September 30, 1999, the short time interval for completion of strategic surveys, and the removal of this species from Survey and Manage Standards and Guidelines after 5 years (and consideration for management under the Agencies' special status species programs).

In three of these four subzones, nonfederal lands are likely to have a significant effect on the species' ability to disperse between major blocks of late-successional forest on federally managed lands. Because of the cumulative effects of land ownership, the No-Action Alternative and Alternatives 1 and 3 will likely provide sufficient habitat to allow the species to stabilize, but in a pattern different from the reference distribution on federal and nonfederal lands combined. Land ownership patterns and management practices on nonfederal land within these subzones strongly influence the species' future distribution here.

In the fifth subzone, which includes an area of the species range not previously understood in the drier, patchier habitats of south-central Oregon and northern California, the effects of the alternatives are less certain. There is insufficient information regarding this species to determine how any alternative would affect distribution and stability within the Xeric Forest Distribution Zone, particularly the portion of the red tree vole's known and suspected range on the Klamath National Forest in northern California. For the No-Action Alternative and Alternatives 1 and 3, there is insufficient information to determine how these alternatives would affect distribution and stability. These factors also affect the outcome in this subzone for Alternative 2, but this alternative is not expected to provide sufficient habitat (including known sites) to provide for stability for reasons similar to those previously identified for this alternative in the other subzones. Anticipated effects outcomes for this species are displayed in Table 2-12 and summarized by taxa in Table S-7.

Species Associated with Early-Successional Forests

The Northwest Forest Plan Final SEIS describes the broad ecological characteristics of early-successional forest associated species and general conclusions about the abundance and distribution of early-successional forest prior to the influences of timber harvest and other land management practices. Those descriptions provide the basis for conclusions regarding effects on early-successional species in the Northwest Forest Plan Final SEIS.

All alternatives would provide adequate acreage and distribution of early-successional habitat, across the planning area, to sustain populations of species dependent on young forest habitat. Currently, there is a relatively large extent of early-successional habitat, the expectation that

nonfederal lands will continue to be harvested, and the expectation that natural disturbances will continue. Harvest on nonfederal lands and natural disturbance processes, such as wildfire and wind events, are likely to create early-successional habitat. The relative amount of newly created habitat is likely to remain the same under all alternatives. Although local populations of early-successional forest associated species would vary in number and distribution over time, these generally mobile and productive species are adapted to colonizing new habitats as they become available.

Threatened and Endangered Species

Northern Spotted Owl

Northern spotted owl habitat under the Northwest Forest Plan depends on management of large reserves with provisions for owl dispersal among the reserves. None of the alternatives would have an effect on the basic land management strategies in the Northwest Forest Plan. After 6 years of implementing the Northwest Forest Plan, experience has shown fewer impacts to the spotted owl population in the Matrix and Adaptive Management Areas than was originally expected due to lower than expected levels of timber harvest and more acreage in Riparian Reserves.

The differences among the alternatives relate to the acreage of protected habitat for Survey and Manage species and the effects on red tree vole, an important prey species. The acreage of protected habitat for Survey and Manage species occurs as scattered, relatively small patches that have little contribution to the spotted owl population. Red tree voles do not represent a large portion of the diet of most spotted owls; any effect to spotted owls from reductions of red tree vole populations is likely to be low. None of the alternatives will affect the original basis for the Biological Assessment or the conclusions of the effects to spotted owls as presented in the Northwest Forest Plan Final SEIS.

Canada Lynx

The Canada lynx was listed as threatened under the Endangered Species Act on April 24, 2000. The No-Action Alternative would retain the Canada Lynx Protection Buffer Standard and Guideline in the Matrix and Adaptive Management Area land allocations.

On February 7, 2000, the Forest Service and the U.S. Fish and Wildlife Service entered into a conservation agreement. The Forest Service agreed to consider conservation measures in the Lynx Conservation Assessment and Strategy when designing and implementing activities that might affect Canada lynx. Under the action alternatives, the Canada Lynx Standard and Guideline would require the Agencies to follow the existing conservation agreement, and consider conservation measures in the Lynx Conservation Assessment and Strategy when designing and implementing actions that could affect Canada lynx or its habitat. Based upon criteria for identifying and mapping suitable habitat as recommended by the Lynx Science Team, no suitable Canada lynx habitat occurs on BLM administered lands in the planning area. This standard and guideline would apply to all land allocations.

Under all alternatives, the Canada lynx is anticipated to have stable populations in suitable habitat distributed in a pattern similar to its historic distribution in the planning area, due to requirements for consultation under the Endangered Species Act, and provisions included in the interagency conservation agreement and related documents.

Other Threatened and Endangered Species

The Northwest Forest Plan Final SEIS addressed all of the Endangered Species Act listed species in the planning area at the time it was prepared. Many species that occur with the Northwest Forest Plan area have been added to the Endangered Species Act list since 1994. As species were subsequently listed, Section 7 consultation was reinitiated as needed. The alternatives would have

no effect on the conclusions in the Northwest Forest Plan Final SEIS, or in subsequent consultations, for listed species. The Agencies will continue to comply with the requirements of the Endangered Species Act and will continue to manage habitat for listed species.

Costs of Management

Costs have been estimated for implementing the Survey and Manage Standards and Guidelines. These costs are based on expenses incurred between 1994 and 1999. During that period, approximately $10.6 million has been spent on "regional" costs and $19.5 million on "field level" costs. Regional costs include developing Survey Protocols, Management Recommendations, and Field Guides, completing strategic surveys, and data management. Field level costs are primarily pre-disturbance surveys. Of the $19.5 million, about $11.0 million was spent in 1999.

Costs of implementing the alternatives on an annual basis was estimated for the short and long term (see Table S-4). Field-level pre-disturbance survey costs account for the majority of expenses across all alternatives in both the short and long term. For the short term, pre-disturbance survey costs account for 95.3 percent of the total cost for the No-Action Alternative, 66.4 percent for Alternative 1, 60.2 percent for Alternative 2, and 82.8 percent for Alternative 3. Strategic surveys account for 3.5 percent, 27.3 percent, 32.2 percent, and 12.9 percent, respectively, in the short term. Reductions in long-term costs are anticipated due to completion of strategic surveys for some species and subsequent reductions in pre-disturbance survey costs.

Socioeconomic

Actual timber harvest, a primary driver of economic, community, and social effects, has lagged behind levels projected in the Northwest Forest Plan Final SEIS for a variety of reasons, including: (1) the time lag between sale and harvest; (2) appeals; (3) lawsuits; (4) listing of new species under the Endangered Species Act; (5) difficulties in implementing the Survey and Manage Standards and Guidelines as originally anticipated; and, (5) Rescission Act Sales. Factors other than declining federal timber harvest have also influenced the lumber and wood products industry in the region.

Under the No-Action Alternative, available timber harvest would support an estimated 4,630 jobs. Under Alternatives 1 and 2, timber harvests and timber-related employment would be greater than under the No-Action Alternative. Under Alternative 3, timber harvest and timber-related employment would be reduced below levels anticipated in the No-Action Alternative.

In addition to timber-related jobs, the Agencies hire a temporary and seasonal workforce that assists with conducting surveys (some surveys are also conducted through contracts). The length and season of employment for these jobs are highly variable, depending on the species and Survey Protocol, so survey-related jobs are expressed in terms of full-time equivalent positions (i.e., 40 hours per week, year-round employment).

The number of jobs that would be supported through timber harvest and survey-related employment under the alternatives are shown in Table S-5 and Table S-7.

S-4. Estimated Annual Costs

	Short-Term (1-5 Years)	Long-Term (6-10 Years)
No-Action Alternative	$117.5 million/year	$114.0 million/year
Alternative 1	$28.6 million/year	$16.8 million/year
Alternative 2	$18.7 million/year	$12.3 million/year
Alternative 3	$60.3 million/year	$48.2 million/year

S-5. Estimated Timber and Survey-Related Jobs

	No-Action	Alternative 1	Alternative 2	Alternative 3
Timber-related jobs	4,630	6,900	7,040	4,130
Survey-related jobs	2,052	499	342	1,051

Timber Harvest

Each alternative would directly affect the level of timber harvested from forest lands administered by the Forest Service and the BLM within the planning area. The Probable Sale Quantity (PSQ) is based only on those lands considered suitable for production of programmed, sustainable timber yields (i.e., lands in the Matrix or Adaptive Management Area land allocations). The 1994 Northwest Forest Plan displayed an estimated average annual PSQ level of 958 million board feet (MMBF). Since 1994, the PSQ has been reduced to 811 MMBF because of changes resulting from completion or corrections to land and resource management plans.

Estimating the effects to PSQ of the various Survey and Manage alternatives is dependent on determining the number of acres of late-successional forest that will ultimately be managed as known sites for Survey and Manage species. Based on recent experience conducting pre-disturbance surveys, it is estimated that it will take 25 years to survey all of the late-successional forest in the Matrix and Adaptive Management Area land allocations. Predicting the eventual number of sites that may affect PSQ was done by projecting the current rate of detection for Survey and Manage species ahead 25 years. An estimate of the average site size per species, times the total number of projected sites, was used to estimate the overall effect on PSQ.

Table S-6 displays the projected PSQ, the percent reduction from the currently declared PSQ of 811 MMBF, the amount of late-successional acres that are predicted to eventually be managed as known sites, and the percent of the total late-successional acres in the Matrix and Adaptive Management Area land allocations that those sites represent, for each alternative. These numbers are range-wide estimates of effects and this SEIS does not make the decision to harvest timber. Actual calculation and re-declaration of PSQ is done at the administrative unit level during plan revision or other plan updating process. Individual sale offerings are subject to additional NEPA analysis.

Comparison Tables

Table S-7 summarizes effects for costs, harvest levels, and employment across all alternatives. This table also summarizes the species effects outcomes by taxa and compares these outcomes

S-6. Projected PSQ and Percent Reduction from Currently Declared PSQ

Alternative	No-Action	1	2	3
Projected annual PSQ in MMBF	510	760	775	455
% reduction from 811 declared	(37%)	(6%)	(4%)	(44%)
L/S acres projected to be species sites	483,000	81,000	61,000	570,000
% of total L/S	(42%)	(7%)	(5%)	(50%)

L/S = late-successional

across all alternatives for species proposed to remain under Survey and Manage in the action alternatives. Table S-8 identifies species with outcomes that vary by alternative and includes a discussion of the reasons for these variations. Table S-8 and the species information on Table S-7 were derived from Table 2-12. Table 2-12 is located at the end Chapter 2 and displays the effects outcomes for all species currently managed under Survey and Manage and discussed in detail in Chapter 3&4.

The following narrative applies to all species currently under Survey and Manage and is summarized from Table 2-12. For most species (397 of 422 outcomes), there is no variation in outcomes by alternative, although there may be variations in the level of uncertainty associated with those outcomes. (Note: Some species have multiple outcomes because effects are displayed for multiple portions of their range.) For 118 species with no variation of outcomes across alternatives, the Survey and Manage Standards and Guidelines and/or other elements of the Northwest Forest Plan will provide habitat (including known sites) of sufficient quality, abundance, and distribution to allow these species to stabilize in a pattern similar to their reference distributions (Outcome 1). For 40 species with no variation across alternatives, the Survey and Manage Standards and Guidelines and/or other elements of the Northwest Forest Plan will provide habitat (including known sites) of sufficient quality, abundance, and distribution to allow species to stabilize in a pattern altered from their reference distributions, with some limitations on biological functions and species interactions (Outcome 2). Another six species have either Outcomes 1 or 2 across all alternatives and are considered stable across all alternatives. For 184 species, across all alternatives, there is insufficient habitat (including known sites) to support stable populations of the species (Outcome 3). For another 55 species across all alternatives there is insufficient information about these species to determine how any alternative would affect distribution and stability (Outcome 4). For most species with Outcome 3 and some with Outcome 4, the species are naturally so rare that they are inherently at risk from some disturbance or other factor and no alternative would entirely remove that risk. Based on current information, it does not seem possible to design an alternative within the scope of this SEIS that could eliminate much or all risk to the stability of these species. Where rare species are closely associated with late-successional forest and Survey and Manage will help, they are proposed to remain under Survey and Manage. They receive equal or greater protection (where practicable) under the action alternatives as they do under the No-Action Alternative. Under the action alternatives, known sites are managed for these species, strategic surveys will be undertaken for them, and if pre-disturbance surveys are practical, they will be conducted prior to habitat-disturbing activities.

The following applies only to those species proposed to remain under Survey and Manage as summarized on S-7 There is no variation in outcomes across alternatives for fungi, lichens, bryophytes, and arthropods. The variation in outcomes for the vertebrates is between Alternative 2 and the other alternatives, while the slight variation in outcomes for vascular plants is between the No-Action Alternative and Alternative 1. There are a number of variations in outcomes for the mollusk species across all alternatives. The vertebrate, mollusk, and vascular plant species with varied outcomes across alternatives are presented in greater detail in Table S-8.

Table S-8 includes summaries of some of the background information used in the Species Review Process (see Table F-2) to assign species to categories and identify concerns expressed by the effects writers in the environmental consequences sections (see Chapter 3&4). Where management actions in one alternative alleviates the concern for species' stability and distribution in another alternative, mitigation consistent with the Purpose and Need of this SEIS is possible. If the decision-makers determine that the preferred alternative does not meet the persistence objectives of the proposed action or otherwise does not provide an acceptable assurance of persistence for these species, incorporation of those additional provisions will be considered.

Species proposed to be removed from Survey and Manage under the action alternatives are shown in Tables 2-4 and 2-5 in Chapter 2. There are 72 species that would be removed from Survey and Manage in all (63 species) or part (9 species) of their range under the action alternatives. Included are 18 fungi, 35 lichens, 11 bryophytes, 2 mollusks, and 6 vascular plants. Twenty-two species are proposed for removal only because they do not meet the second basic criterion for inclusion under

Table S-7. Summary of Effects

Species Effects - Number of species in each outcome, by taxa group and alternative

	Outcome 1[1]				Outcome 2				Outcome 3				Outcome 4				
Alternative	**NA**	**1**	**2**	**3**	**NA**	**1**	**2**	**3**	**NA**	**1**	**2**	**3**	**NA**	**1**	**2**	**3**	**Total for each Alt.**
Fungi	29	29	29	29	5	5	5	5	164	164	164	164	11	11	11	11	209
Lichens	15	15	15	15	6	6	6	6	12	12	12	12	20	20	20	20	53
Bryophytes	7	7	7	7	-	-	-	-	-	-	-	-	10	10	10	10	17
Vertebrates	11	11	4	11	-	-	3	-	-	-	5	-	1	1	-	1	12
Mollusks	10	9	9	15	33	27	29	31	3	10	8	-	-	-	-	-	46
Vascular Plants	9	11	11	11	3	1	1	1	-	-	-	-	-	-	-	-	12
Arthropods	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4	4	4
Totals	81	82	75	88	47	39	44	43	179	186	189	176	46	46	45	46	353[2]

Other Resource Effects by Alternative

Alternative	**No-Action**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Comments**
Annual Costs:[3] Short-Term	$118 million[4]	$29 million	$19 million	$60 million	Pre-disturbance field survey costs are 60-96% of costs.
Long-Term	$114 million[4]	$17 million	$12 million	$48 million	
Projected Acres Managed as Known Sites	483,000 acres	81,000 acres	61,000 acres	570,000 acres	Projected for 25 years, Matrix and AMA only
Projected Harvest Level[5] (Current declared PSQ: 811)	510 MMBF	760 MMBF	775 MMBF	455 MMBF	MMBF = Million Board Feet, annually
Employment (Wood Products)	4,630	6,900	7,040	4,130	
Employment (Survey Related)	2,050	500	350	1,050	

[1]See narrative referencing this table, the Background section in Chapter 3&4, or Glossary for description of outcomes. Does not include species proposed for removal from Survey and Manage under the action alternatives.
[2]Number of outcomes exceeds 346 because a few species have different outcomes for different geographic areas.
[3]Fiscal year 1999 Survey and Manage budget was about $8 million, fiscal year 2000 is about $12 million.
[4]Includes $93 million for fungi pre-disturbance surveys that require a 5-year, multi-visit sampling protocol considered "impractical" in the other alternatives.
[5]The NFP FSEIS estimated 6 MMBF as the effect of Survey and Manage. The PSQ effects for the alternatives are based on projecting current estimated acres of known sites for 25 years, with eventual limits on 14 species. Actual PSQ will be affected by future adaptive management decisions and identification of high-priority sites in Management Recommendations. Does not include 10% "other wood."

Survey and Manage which states "The species must be closely associated with late-successional or old-growth forest." These species are already on, or are currently being considered for, the Agencies' special status species programs. Known sites for these species (1 fungi, 14 lichens, 6 bryophytes, and 1 vascular plant) will be managed until their disposition is clarified under those programs. For the remaining 50 "Off" species, the reserve system and other standards and guidelines of the Northwest Forest Plan appear to provide for a reasonable assurance of species persistence, they have been determined to be synonyms of other species, or they do not occur within the Northwest Forest Plan area.

Mitigation Measures

Survey and Manage and the other standards and guidelines proposed for amendment in this SEIS are mitigation measures included in the 1994 Northwest Forest Plan. They were designed to improve the distribution and stability of certain species and to decrease the likelihood of extirpation of these species from federally managed lands in the Northwest Forest Plan area. Like other elements of the Northwest Forest Plan, these measures help avoid, minimize, rectify, reduce, or eliminate potentially adverse environmental impacts of land management activities.

The alternatives vary in how well they would satisfy the persistence objectives of the proposed action. For some species, the effects under alternatives other than the preferred alternative are anticipated to result in more stable populations. This suggests there are ways to mitigate these effects simply by borrowing applicable management elements from those alternatives. If the decision-makers determine that the preferred alternative does not meet the persistence objectives for these species, incorporation of additional mitigation will be considered. For example, certain mollusks with concerns under Alternative 1 would apparently benefit from the addition of equivalent-effort surveys in Alternative 3. Table S-8 shows species with outcomes that vary by alternative.

For a substantial number of species, outcomes do not change across alternatives and these outcomes indicate that there are still concerns for persistence despite the mitigation measures provided in the alternatives. These are species that are so rare or isolated that no alternative consistent with the Purpose and Need would remove all persistence concerns. Despite the continued concern for persistence of these species, the Survey and Manage mitigation measure will continue to reduce risks of extirpation and enhance the likelihood that the species will remain well distributed.

Applying additional measures to the alternatives must be considered in the context of practicality and reasonable assurance. To the extent such mitigation would change the balance and practicableness of the Northwest Forest Plan, additional mitigation may not be necessary in order to provide a reasonable assurance of species persistence.

Monitoring

Monitoring for the Survey and Manage Standards and Guidelines will continue to tier from the monitoring direction included in the Northwest Forest Plan. It will be adapted to the new categories described for the action alternatives. Monitoring will build upon new information identified in this SEIS and compiled in future years during the annual Species Review Process. Sources of new information that will contribute to monitoring and help identify specific monitoring questions include pre-disturbance and strategic surveys, as well as publications, research results, the public, and academia. The primary objective of monitoring relative to Survey and Manage species is to determine if species persistence objectives are being met.

Table S-8. Species With Outcomes That Vary By Alternative					
TAXA GROUP *Species*	**Outcomes by Alternative**				
	No-A Alt.	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Comments (Information extracted from Table F-2 and Chapter 3&4 Effects Sections)**
VERTEBRATES					
Del Norte salamander *Phethodon elongaatus*	1(M)	1(H)	2(H)	1(H)	**F-2**: Moderate/high number of recent Federal sites in Northwest Forest Plan area, 40 percent in reserves. Need to determine high-priority sites for management. Pre-disturbance survey not necessary. **Reasons for Concerns**: For Alt. 2, the concern is uncertain future management after 5 years, short length of time to collect necessary information to direct future management, and possible loss in connectivity due to not managing all known sites.
Siskiyou Mountains salamander *Plethodon stormi* (Oregon)	1(M)	1(M)	2(H)	1(M)	**F-2**: Moderate/high number of recent Federal sites in Northwest Forest Plan area. Limited range/habitat. Need to determine high-priority sites for management. Restricted habitat; not likely to find many new sites with pre-disturbance surveys. Pre-disturbance survey practical. **Reasons for Concerns**: For Alt. 2, the concern is uncertain future management after 5 years, short length of time to collect necessary information to direct future management, and possible loss in connectivity due to not managing all known sites. Additionally, in Oregon, vulnerability to site losses is exceptionally high due to the dominance of the Adaptive Management Area land allocation within this species' range on federally managed lands. In California, there is a possible loss of sites in the southeast portion of its range. Forty-seven percent of range is in Adaptive Manage Area or Matrix land allocation.
Red Tree Vole *Arborimus longicaudus*	1(H)	1(H)	3(M)	1(H)	**F-2**: Moderate number of recent Federal sites in the Northwest Forest Plan area, extensive recent surveys in some areas. Need to determine appropriate management for this species, including high-priority sites. Pre-disturbance survey practical. (114 confirmed active nests; remainder are possibly active, not confirmed.) **Reasons for Concerns**: Under Alt. 2, there is no requirement for pre-disturbance surveys, only known sites as of 9/30/99 would be managed, and strategic survey would be completed in 5 years. There could be inadvertent loss of sites during interim 5 years; potential for isolation of populations and loss of connectivity; limited, uneven distribution of surveys across species range; requires multi-generational data to determine demographics, population trends, and density status. In the xeric zone, there are outcomes 4's for the No-Action Alternatives and Alternatives 1 and 3 due to lack of information with outcome 2 in Alternative 2 for the same reasons as above. Considering cumulative effects (all land ownerships), the outcomes for the No-Action Alternative and Alternatives 1 and 3 change from outcome 1 to outcome 2.

Table S-8. Species With Outcomes That Vary By Alternative

TAXA GROUP *Species*	Outcomes by Alternative				
	No-A Alt.	Alt. 1	Alt. 2	Alt. 3	Comments (Information extracted from Table F-2 and Chapter 3&4 Effects Sections)
MOLLUSKS					
Ancotrema voyanum	3(M)	3(M)	3(M)	1(M)	**F-2**: Low number of recent Federal sites in the Northwest Forest Plan area, but with little survey effort to date. Late-successional or old-growth forest association questionable. Riparian reserves may protect some habitat. **Reasons for Concerns**: Low number of known sites. No pre-disturbance or general regional (strategic) surveys in the No-Action Alt. Under Alternatives 1 and 2, there are no pre-disturbance surveys.
Deroceras hesperium	2(H)	3(H)	3(H)	2(H)	**F-2**: Very low number of recent Federal sites in Northwest Forest Plan area. Late-successional or old-growth forest association uncertain, deferring to FEMAT. Pre-disturbance survey not practical, look-alike species are common, species is poorly described and requires an expert to identify. **Reasons for Concerns**: Neither Alternative 1 or 2 requires pre-disturbance surveys.
Helminthoglypta hertleini	2(M)	3(M)	3(M)	1(M)	**F-2**: Very low number of recent Federal sites in Northwest Forest Plan area, most known sites on nonfederal lands. Pre-disturbance survey not practical, requires identification by a limited number of experts; morphological variation common at the edge of its range. **Reasons for Concerns**: Neither Alternative 1 or 2 requires pre-disturbance surveys.
Hemphillia pantherina	2(M)	3(H)	3(H)	2(M)	**F-2**: No recent Federal sites in Northwest Forest Plan area. Late-successional or old-growth forest association uncertain, deferring to FEMAT. Pre-disturbance survey not practical, no specimens available, described characteristics may not well represent the species as they are based on limited specimens, expert identification required. **Reasons for Concerns**: Neither Alternative 1 or 2 requires pre-disturbance surveys.
Megomphix hemphilli, South of south boundary of Lincoln, Benton, and Linn Counties, Oregon	2(M)	3(H)	2(M)	2(M)	**F-2**: Moderate number of recent Federal sites in Northwest Forest Plan area. Pre-disturbance survey practical. **Reasons for Concerns**: Under Alt. 1, not managing known sites, potential loss of connectivity, and no pre-disturbance surveys. Unknown if sufficient sites in reserve land allocations.
Monadenia chaceana	1(M)	3(H)	3(H)	1(M)	**F-2**: Low/moderate number of recent Federal sites in Northwest Forest Plan area. Pre-disturbance survey not practical; expert identification required and even experts may disagree. **Reasons for Concerns**: Neither Alternative 1 or 2 requires pre-disturbance surveys.

Table S-8. Species With Outcomes That Vary By Alternative					
TAXA GROUP ***Species***	**Outcomes by Alternative**				
	No-A Alt.	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Comments (Information extracted from Table F-2 and Chapter 3&4 Effects Sections)**
MOLLUSKS (continued)					
Monadenia churchi	2(M)	3(H)	2(M)	2(M)	**F-2**: High number of recent Federal sites in Northwest Forest Plan area, though restricted to a limited range. May be common, uncertain concern for persistence. Pre-disturbance survey practical. **Reasons for Concerns**: Under Alt. 1, not managing known sites, potential loss of connectivity, and no pre-disturbance surveys. Unknown if sufficient sites in reserve land allocations.
Monadenia fidelis klamathica	3(M)	3(M)	3(M)	2(M)	**F-2**: Very low number of recent Federal sites in Northwest Forest Plan area, but with little survey effort to date. Pre-disturbance survey not practical, defining characteristics only relative in nature, juveniles cannot be identified to species, and many look-alikes; expert identification required. **Reasons for Concerns**: Under the No-Action Alternative and Alternatives 1 and 2, concern raised by limited range, few known sites, and loss of undiscovered sites because of no pre-disturbance surveys. Under the No-Action Alternative, there are no general regional (strategic) surveys.
Monadenia fidelis ochromphalus	3(M)	3(M)	3(M)	2(M)	**F-2**: Low/moderate number of recent Federal sites in Northwest Forest Plan area, but with little survey effort. Late-successional or old-growth forest association uncertain, deferring to FEMAT. Pre-disturbance survey not practical, defining characteristics only relative in nature, juveniles cannot be identified to species, and many look-alikes; expert identification required. **Reasons for Concerns**: Under the No-Action Alternative and Alternatives 1 and 2, concern raised by limited range, few known sites, and loss of undiscovered sites because of no pre-disturbance surveys. Under the No-Action Alternative, there are no general regional (strategic) surveys.
Pristoloma articum crateris	1(H)	3(M)	3(H)	1(L)	**F-2**: Low number of recent Federal sites in Northwest Forest Plan area. Pre-disturbance survey not practical, very small (2.75 mm), forest floor dweller; expert identification required. **Reasons for Concerns**: Neither Alternative 1 or 2 require pre-disturbance surveys.

Table S-8. Species With Outcomes That Vary By Alternative					
TAXA GROUP ***Species***	**Outcomes by Alternative**				
	No-A Alt.	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Comments (Information extracted from Table F-2 and Chapter 3&4 Effects Sections)**
VASCULAR PLANTS					
Cypripedium fasciculatum (entire range)	2(M)	1(M)	1(M)	1(M	**F-2**: High number of recent Federal sites in Northwest Forest Plan area, but many sites with very small populations; still at risk. Expand to apply to all range within Northwest Forest Plan area. Need to determine high-priority sites for management. Pre-disturbance survey practical. **Reasons for Concerns**: Under the action alternatives, Survey and Manage Standards and Guidelines, including strategic surveys, are applied throughout the range of the species.
Cypripedium montanum (entire range)	2(M)	1(M)	1(M)	1(M)	**F-2**: Moderate/high number of recent Federal sites in Northwest Forest Plan area, but many sites with very low populations; still at risk. Expand to apply to all range within Northwest Forest Plan area. Need to determine high-priority sites for management. Pre-disturbance survey practical. **Reasons for Concerns**: Under the action alternatives, Survey and Manage Standards and Guidelines, including strategic surveys, are applied throughout the range of the species.
H = high level of uncertainty, M = moderate level of uncertainty, L = low level of uncertainty					

Concerns Identified in Public Comments to the Draft SEIS

The 90-day public comment period for the Draft SEIS began on December 4, 1999, and ended on March 3, 2000. Agencies, officials, and the public were invited to comment.

During the comment period, approximately 3,900 comments were received in the form of letters, postcards, facsimiles, and e-mails (collectively referred to as letters). Letters were received from a variety of interests including scientists, individuals, organizations, businesses, Advisory Committees, Federal and State Agencies, Tribal governments, and elected officials. The substantive comments from these letters were summarized into comment statements, a response was written for each, and they were used to make improvements to this Final SEIS. The comment statements and responses are included in Appendix I. Letters from Federal, State, and local government agencies, American Indian Tribal organizations, elected officials, and Advisory Committees are also reprinted in their entirety in Appendix H.

During the comment period for the Draft SEIS, several areas of controversy were raised in letters. These areas of controversy with a brief explanation of how they were addressed in the Final SEIS are listed below. This is not a complete summary of all public comments.

- *A "no old-growth harvest" alternative should be considered*. This SEIS does not include a no old-growth harvest alternative because the Purpose and Need identified for this SEIS describes a need to amend some mitigation measures contained in the1994 Northwest Forest Plan Final SEIS. The 1994 Final SEIS, which this SEIS supplements, did include an alternative that did not harvest late-successional and old-growth forests.

- *The annual species review process is based too much on professional judgment and too little on well-defined, numerical criteria*. The Agencies have determined that the proposed, more qualitative criteria coupled with professional judgment will result in more appropriate management for the species because the sometimes limited data available about individual species must be weighed in the context of species distribution, habitat quality and distribution, levels of survey effort, and so forth.

- *Individual arthropod species are excluded from future inclusion in Survey and Manage*. The concern for arthropods that led to their inclusion in Survey and Manage in 1994 was for the role of certain functional groups in high-fire frequency areas. Overlap in function, rapid speciation, narrow geographic distributions of individual species, and other factors indicate the group approach is most appropriate.

- *At least one mollusk species may actually be multiple species not yet described in published taxonomic literature*. This point is detailed in the effects section for mollusks and will be considered by the decision-makers.

- *The Agencies' taxa specialists may not be sufficiently knowledgeable to describe effects to species in this SEIS*. The Agencies' taxa specialists that contributed to this SEIS are highly qualified, experienced personnel who have drawn from all currently available information about these species. The fact that the public comment period provided very little new information about species is testament to the thoroughness of the taxa specialists in gathering and incorporating relevant information.

- *The costs of implementing the alternatives exceed current budget levels*. The Final SEIS contains specific assumptions about funding. It is assumed that adequate funds will be available to implement the alternatives as described. A discussion of the implications of reduced funding has been added to Chapter 3&4. Since most of the costs are part of project preparation costs, the Agencies are expecting to apply the standards and guidelines as written.

- *Alternative 3 does not meet the balance of species protection and timber harvest described in the Northwest Forest Plan*. Providing species protection and providing resource outputs are two of the four issues identified in the Issues section of Chapter 2. The decision-makers will weigh the alternatives against those issues.

Ongoing Process of Adaptive Management

A concept woven throughout the Northwest Forest Plan is adaptive management. As defined in the standards and guidelines, adaptive management "is a continuing process of action-based planning, monitoring, researching, evaluating, and adjusting with the objective of improving the implementation and achieving the goals of these standards and guidelines" (USDA, USDI 1994b, p. E-12). In this vein, the Agencies have learned a considerable amount as a result of having implemented Survey and Manage measures since adoption of the Northwest Forest Plan. On an operational level, the Agencies have learned that applying such measures to some species is quite complex, can be relatively costly, and poses technical and feasibility challenges that have proven more difficult to overcome than originally envisioned. The Agencies have also learned that, in certain applications, the Survey and Manage mitigation measures could benefit greatly from added clarity, appear to conflict with each other, require a relatively inefficient use of funds and personnel to meet their objectives, and may operate to unduly undermine the careful balance between resource protection and production at the heart of the Northwest Forest Plan.

At a conceptual level, meanwhile, it has become increasingly clear that implementation of the species-specific Survey and Manage mitigation measures, adopted to help meet one of the major conservation features of providing for persistence of species closely associated with late-successional and old-growth forests, can considerably complicate meeting another major goal of implementing a landscape-scale, ecosystem-oriented, conservation strategy. Put another way, while the core components of the Northwest Forest Plan's conservation strategy rely primarily on a broad-scale approach to conservation, the Survey and Manage Standards and Guidelines, by and large, represent site- and species-specific measures. As more is learned over time, and consistent with sound principles of conservation biology and adaptive management, the Agencies intend to work toward a more complementary and efficient application of these two approaches in a manner that emphasizes and seeks to utilize broad-scale methodologies to the extent appropriate.

The proposed action is an important step and is consistent with this longer-range vision. For example, the increased emphasis on the use of strategic surveys is designed to generate data that will help the Agencies better determine the distribution, abundance, and habitat associations of species. Strategic surveys are also designed to generate other information that can be used to develop more effective and cost-efficient conservation planning tools to better meet the Northwest Forest Plan needs of species persistence and commodity production. As their knowledge base continues to grow, the Agencies will seek and utilize opportunities to take advantage of overlaps in species distributions, persistence issues, ecosystem function, and life-history and habitat associations. Of course, acquiring additional data can also be expected to fill in some of the relatively large information gaps that exist for many of the Survey and Manage species. This additional data can also shed light on items such as the actual rarity of species and/or the extent to which the core components of the Northwest Forest Plan conservation strategy do, in fact, provide adequate protection. Indeed, information gained since adoption of the Northwest Forest Plan has shown that 50 species originally assigned to receive some form of Survey and Manage mitigation no longer warrant supplemental protection in all or part of their range. As a result, the proposed action would provide for the conservation of these species through the core components of the Northwest Forest Plan conservation strategy.

This is not to suggest that species-specific mitigation measures will eventually become obsolete or that this approach will no longer play any role in how the Northwest Forest Plan provides for persistence of some species. Nor does it mean that the biological principles underlying the proposed action are unsound or that a wholesale reorientation away from the Survey and Manage mitigation measures is needed. Several public comments on the Draft SEIS encouraged the

Agencies to undertake just such a fundamental overhaul. After careful consideration, however, the Agencies have concluded that engaging in a fundamental restructuring of the Survey and Manage Standards and Guidelines at this time is not warranted. The information presently available does not indicate any other feasible alternatives exist that could satisfy the objectives underlying the Northwest Forest Plan. The Agencies will continue to acquire new information to markedly improve implementation in a way that will increase efficiencies and that may facilitate a more fundamental shift at an appropriate time.